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PHYLOGENETIC RELATIONSHIPS OF THE SARAWAK *Microhyla* (AMPHIBIAN: ANURA: MICROHYLIDAE)

RAMLAH ZAINUDIN[1,2*] and NOORAINA ATIRA ALAUDIN[1]

[1]*Faculty of Resources Sciences and Technology, Universiti Malaysia Sarawak, 94300, Kota Samarahan, Sarawak*
[2]*Center for Pre-University Studies, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak*
[*]*E-mail: zramlah@unimas.my*

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ABSTRACT

Microhyla is a genus of diminutive frogs that its taxonomic still remains misconceived. This study attempts to re-construct the relationships of the genus *Microhyla* in Sarawak by using 16S rRNA gene marker. Samples were collected from nine study areas in Northeastern and Southwestern region of Sarawak via forest and stream transects. Total of 498 bp of 16S rRNA gene were successfully sequenced from 29 individuals. All the phylogenetic topologies revealed two major clades strongly supported with slightly different topologies and groupings. Presumed the differences between these major group were relative of finger I length and numbers of metatarsal tubercles. *M. berdmorei* and *M. borneensis* (Clade A) can be grouped together considering relative of finger I is less than half of II and presence of two metatarsals tubercles. Per contra, *M. petrigena* and *M. perparva* (Clade B) have finger I present as a snub or pronounced bulge and single number of metatarsal tubercle. This study suggest that *M. malang, M. nephenticola* and *M. borneensis* are synonymous species as the results of low genetic divergence but there are lack of studies to prove this study.

Key words: *Microhyla*, 16S rRNA, phylogenetic relationship, synonymous

INTRODUCTION

Anuran in general and frog in particular is hypersensitive to water loss. Smaller frog essentially Microhylid has a high surface to volume ratio, which increases the likelihood of susceptibility to predation by invertebrates thus choose to inhabit terrestrial area (Rittmeyer *et al.*, 2012). Microhylid is a diverse group of subterranean, terrestrial and arboreal frogs, which present in northern Australasia, South and Southeast Asia, sub-Saharan Africa, Madagascar and South America (Loader *et al*., 2004; Alaudin, np). A total of seven genera have been listed in the family of Microhylidae namely *Chaperina*, *Gastrophrynoides, Glyphoglossus, Kalophrynus, Kaloula, Metaphrynella* and *Microhyla* (Inger & Lian, 1996; Inger & Stuebing, 2005).

The Microhylids seem to be very minute in size. Das and Haas (2010) stated that amphibian species less than 15 mm termed as 'diminutive', 'minute' or 'miniature'. Microhylids can grow up to 1.6 inches (40 mm) long from snout to rump though some never reach 0.5 inches (13 mm) long as an adult frog. Females are generally larger than males. In addition, Frost *et al*. (2006) and Matsui *et al*. (2011) interpreted that the family of microhylid exhibits circumtropic distribution and is diagnosed by many unique musculature and larval characteristics, including the presence of a posteromedial, positioned spiracle and absences of keratodonts and keratinized jaw in larvae sheath.

The genus *Microhyla* Tschudi (1838) is relatively known with 34 species currently recognized in the world (Frost, 2011) and has been found in Indian subcontinent, Indo-Malaya and Indo-China (Matsui *et al*., 2005b; Frost, 2011). There are seven nominal species reported in Borneo alone but only six species have been identified so far in Sarawak which are *Microhyla berdmorei* (Blyth, 1856); *M. borneensis* (Parker, 1928); *M. petrigena* (Inger & Frogner, 1979); *M. perparva* (Inger & Frogner, 1979); *M. nepenthicola* (Das & Haas, 2010) and *M. malang* (Matsui, 2011).

* To whom correspondence should be addressed.